

VALLEY 

FALL 2010

# pivotpoint

Building the most durable and reliable machine in the industry.

As **strong** as they come

The **cornerstone** of Valley

**More** strength with Valley



## It's the Little Things That Count

Too many times, sweating the small stuff is regarded as adding unneeded stress to your life. If you focus on all of the little things, it overpowers the ability to see the big picture and therefore puts you at risk in your operation. Impulse tells you to not worry about the small things and to move on to the bigger and better things. Well, if a manufacturer isn't sweating the small stuff on a daily basis, I'd be concerned – especially if it's your irrigation provider.

At Valmont Irrigation, we've refined our engineering and manufacturing processes to make certain that what may seem minuscule to others is actually of substantial concern to us. This issue of PivotPoint showcases how it all comes down to details. Taking direct comparisons against competing irrigation providers, you'll see that Valmont Irrigation is leading the way in sweating the small stuff – having foresight for our growers and making critical adjustments to structures, components and manufacturing that withstand the test of time and the elements you face every day.

Some may call it 'taking your eye off the big game' – to us, you have no game if you don't continually look for ways to improve. So remember when it comes to long-lasting, field-tested, reliable irrigation machines – Valley is what it is, because it's the little things that mattered along the way.

**LEN ADAMS**  
President - Global Irrigation

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# As STRONG As They Come

## Valley Structures:



A failure at any point of an irrigation structure that shuts a pivot down can spell disaster for crops. But the day in, day out demands put on irrigation structures can be extreme. How can Valley structures seem to take on the toughest conditions and remain the most reliable, long-lasting and best selling irrigation equipment in the industry? When it comes to irrigating, for maximum productivity, you need maximum strength. Valley structures are known as the strongest and most dependable in the industry, according to industry experts, independent lab testing and, most of all, growers whose crops depend on that strength.

**"With less than 9 inches of rain per year, this is really a desert we're farming here! So dependability is key. For someone who farms potatoes, going even a few days without being able to irrigate can make a huge impact on the crop,"** said David Drouhard, a grower from Othello, Washington who farms 245 hectares of irrigated land. **"Up here, Valley structures are the only thing to have. In fact, when I was looking to buy a farm, my banker told me that a farm here in the Columbia basin area is valued much higher if it has Valley equipment on it. Even the banks realize this equipment lasts longer and holds its worth. That was powerful."**

The strength of Valley structures isn't an accident. It comes from more than half a century of experience creating elements within the structural design that ensure the field loads are distributed uniformly throughout the structure, protecting its integrity and extending its life span. Key to the dependability built into all Valley structures is both superior design engineering and dedicated testing throughout the design and manufacturing processes.

**"We can take a customer on a walk-through of a Valley machine, and from the overview level of how the spans are structured, to the detail level such as the alignment cam return spring, there are clues all over that machine that over the past 50 years, Valmont's engineers have had their act together (in the best interest of the grower)."**

— Erik Tribelhorn - Quality Irrigation, Yuma, CO

## Designing STRENGTH

All Valley design engineers use an advanced design method called Finite Element Analysis. This design technique uses computer modeling to analyze new designs to identify where high stress loads exist. After analysis of the modeling, the design is refined to reduce that stress. Craig Malsam, vice president of engineering explained some of the details. "This load distribution analysis can be completed on individual pieces of the span or the entire span itself. This helps us optimize design from the materials and strength standpoints based on the worst case conditions the components may experience in the field. We then take it into the field and validate our findings."

Valley owners note these superior design details. Drouhard has other irrigation equipment on his farm, but is very clear about his preference for Valley and why. "My Valley pivots are the best machines I have. They are just superior when it comes to engineering. They have a better design. They maintain their arch, for example. Some of the other machines I have on my farm have dips in the arch.

And all of this means they don't break down. I don't see cracking like I do with irrigation components I have from other companies. This, to me, is the best test of all."

Malsam is glad to know the structures hold up so well in the field, but not surprised. "After we design the structures, we do extensive testing here at Valmont to actually try to break them down. We recreate the types of stresses the span faces in the field. In one test we perform accelerated life testing, exposing the structure to loads and stresses over the course of two weeks that would normally occur over 20 years to show us how durable the new design may be. We want the growers to have the most dependable spans possible, and that is what they expect from us."



3D Computer analysis of loads and stresses on the Valley drive unit.

## Down to the DETAILS

The superior strength and durability of the Valley structures compared to the competition is well known. From a distance, all structures may appear to be the same. However, as you take a closer look, the difference that gives Valley structures their superior strength and durability are obvious.

One excellent example: the welded coupler. This is one of the features that make Valley structures stand out from the rest. Some competing machines employ a drilled design to lower their manufacturing costs, deforming the wall of the irrigation pipe to form the outlet for the sprinkler. Valley sprinkler outlets are solid steel and welded to the irrigation pipe. This is a stronger design and has been proven over many years. According to Malsam "The main reason why competing machines failed at just one fifth of the lifespan of a Valley structure is because of the weakening in the pipe caused by the drilled coupler."



The design and strength of the coupler may seem trivial. But, imagine the number of cyclic loads introduced into the coupler and pipe as the sprinkler drop sways into the wind, or as it's dragged through crops, or as the drive unit travels over ridges. Like a paper clip that can break after repeated bending, so can a structure as cracks start to form around the drilled coupler due to the cyclic loads. Drouhard sees these benefits in several of the other Valley structures he has on his 245-hectare operation. "We raise potatoes, and this

means our irrigation machines have to go over the corrugates or hills where the potatoes are planted. This puts additional stress on the machines. There isn't a permanent circle track with potatoes like there is with alfalfa or other crops."

Another apparent difference is the Valley span connections, with their ball and socket design. The design allows for free movement in all directions helping reduce the overall stress this movement might otherwise create; unlike competing span connections designed with uni-knuckle or hook and eye designs. In a uni-knuckle design, the connections move only in two directions and must absorb the load when the span rolls sideways or up a hill, which shortens the lifespan, especially for longer machines. Connections with hook-and-eye design can rotate but if they experience significant rolls, the torque can carry from one span to another, creating a higher stress on those pieces.

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“Customers in our area really value the durability and reliability of Valley gearboxes. They are the strongest in the industry. The fact that they are made in America isn’t just patriotic, either. We all want to think that when it says ‘Made in America’ that makes an item the best. Sometimes that’s true, sometimes not. But the Valley gearbox is clear proof of where that is true.”

*Doug Grand - Grand Irrigation, Clear Lake, MN*

**SINCE 1974 Valley is the only manufacturer who designs and manufactures its own gearbox.** Through the decades, the Valley gearbox has become legendary in both the irrigation industry and among growers. It’s the longest-lasting gearbox available and many of the original gearboxes are still hard at work, helping spans traverse a wide array of terrain types across the US. and, globally. Valley continues to invest in the Valley gearbox to ensure it remains **the industry’s strongest and longest lasting.**



**Building the best in the US**

The Valley Gearbox’s American origin is not just patriotic – it is a key reason why they bear the title of strongest and longest lasting gearbox in the industry. Of course, accomplishing this does take discipline, according to Steve LeGrand, vice president of operations at Valmont Irrigation, but it coincides with the Valley philosophy. “Our customers expect longevity from their Valley gearboxes. While cutting corners might save money on the front end, it only reduces the life span of the gearbox and costs the grower more in the long term. Our focus is on manufacturing the best gearbox possible, and to do so, using the best quality materials is not negotiable.”

The recipe for success starts with materials that go into a Valley gearbox. “The quality of materials we use is very important,” LeGrand continued. “When you put an immense amount of torque on something, you have to use very strong materials.” Because all Valley gearboxes are built in the US, Valmont Irrigation has the ability to control the quality of the components going into the gearboxes and, conducts testing of each gearbox before a unit ever ships to the dealer.

The manufacturing process at Valmont Irrigation is the next ingredient in the success of the Valley gearbox. “Using advanced

machining methods is another vital component in the success of our gearboxes,” LeGrand further explained. “While we focus on the mechanical properties and quality of the materials we use, it’s just as important that we focus on how these materials interact together. Surfaces must be machined properly so there is a perfect fit. Improving all of these operations increases the dependability and life span of the gearbox.”

Variability is higher in gearboxes manufactured overseas, and LeGrand explained why this is an important consideration for growers as they determine what gearbox to choose. “There is a lot more manufacturing variations in other gearboxes sold, or produced, by the competition. Much of this work is accomplished manually, by hand. Our quality variations in production are greatly minimized because of our advanced manufacturing and automation processes.” “In addition, every part of the gearbox is checked for quality control before it goes to the next phase of production. There is a strong, consistent regimen of quality checks in place throughout the process to assure our customers receive a great gearbox,” LeGrand added.

# The cornerstone of Valley

**Strongest and Longest Lasting**

“The gearbox is the heart and soul of Valley. It’s the cornerstone of who we are. Its core design remains the same, but we continue to improve it through engineering and design refinements, the quality and type of materials we use in it and the processes in which we manufacture,” explained Craig Malsam, vice president of engineering at Valmont Irrigation.

One of the most significant differences between the Valley gearbox and competitive gearboxes is the high strength ductile iron worm gear. Unlike competitive gearboxes manufactured in China, the Valley gearbox includes a high strength ductile iron worm instead of the conventional steel worm. This detail may not seem to be revolutionary, however when it comes to preserving durability and adding life to the box, it is.

Here’s why. One reason a gear can fail is due to tooth wear. This wear occurs when the surface oil film breaks down under heavy loads and metal-to-metal contact occurs at raised surface points. Over time, this wear can cause a tooth to fail. Steel worms cannot take on the same wear load as ductile iron worms. Because ductile iron performs better under extreme load conditions, Valmont chose to use this high strength metal in their gear construction to further enhance longevity and durability. Unlike most metals purchased overseas, the

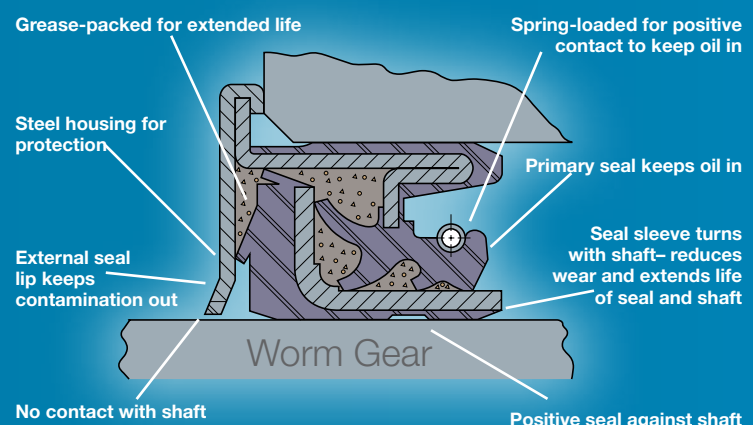
manufacturing process for ductile iron is tightly controlled in the US, producing consistent, high-quality material.

Along with the high ductile iron material, the gearbox tooth design is another testament to the continued focus Valmont places on getting the design details right. A common reason for gear failure is tooth breakage due to fatigue. While competing gearboxes include teeth cut at a 14.5-degree angle, teeth on the Valley gearbox are cut at a 25-degree angle. This may not sound like a significant difference, but it is. Why? While the competing gearbox teeth may appear stronger because it is wider at the tip, it’s deceiving. Teeth generally do not fail at the tip, but instead at the base. This is where the 25 degree-cut tooth is actually wider and stronger, preventing breakage and keeping the gearbox up and running longer.

Another strength of the Valley gearbox is the NTN bearing. These bearings are made in the US using ultra pure steel that is precision ground and surface hardened. Here’s where not only material quality, but manufacturing processes, also comes into play. This surface hardening provides superior wear while maintaining the inner toughness of the base metal. In fact, because of their materials and design, the NTN bearings have a 40% higher load rating than bearings used in competing gearboxes because they’re not subject to the cracking under increased loads.

The next success factor for the Valley gearbox is the industry exclusive, patented seal design. The quality of seals has a major impact on the life of a gearbox. In the past, this has been a central issue in keeping irrigation equipment running longer. When oil leaked, the gearbox would fail far too early due to tooth wear and bearing rust. Valley recognized early on that one of the most critical factors in building a gearbox with longevity was finding a better way to prevent these drawbacks.

**Exclusive patented seal design**



Starting in 1995, Valley began research on how to resolve this issue and design a seal that would have significantly longer life when operating in a mud slurry environment. By 1997, Valmont identified a major seal manufacturer and together, they developed a revolutionary new design. A patented seal that’s only available on Valley gearboxes. Malsam explained. “The patented seal specifically developed for the Valley gearbox is just one of the things that set it apart from other gearboxes. Independent lab tests have shown that the seal has 3.5 to 4 times the lifespan that conventional seals have. They’ve greatly reduced issues of oil leakage which in turn has dramatically increased the life of the seals and, in the end, the gearbox.”

Working in conjunction with the patented seal is the unique expansion chamber. The large diaphragm inside the chamber minimizes pressure fluctuations inside the gearbox, decreasing water and contaminants being drawn into the gearbox during pressure changes “The design of the patented seal and expansion chamber have a significant impact on the durability and longevity of the Valley gearbox,” stated Malsam. “Keeping oil in and water and contaminants out is critical, which is why the Valley gearbox is designed the way it is.”

After incorporating the highest quality materials, the most modern and automated production processes and constant focus on implementing detailed design improvements, the final step in the Valley gearbox's road to success lies in testing. This is a source of pride at Valmont Irrigation, according to Malsam. "The Valley gearbox is the strongest gearbox on the market, proven through independent testing. Some have been running for over 30 years and are still going strong!" In addition to doing independent testing verified by outside experts, Valmont Irrigation houses its own test lab at the manufacturing facility in Valley, Nebraska. "We have our own test lab. We periodically run tests for longevity and torque power," Malsam said.



Valmont Irrigation is committed to holding on to their title as manufacturer of the best gearbox in the industry. They're also committed to continuing the improvements and increases in lifespan their customers have grown to expect from them. That commitment doesn't just include words, either. It includes investment in facilities, processes and technology.

In 2008, the production facility in Valley, Nebraska, underwent a \$5 million renovation and expansion that included a 835 square meter addition. "We made this large investment to ensure our gearbox manufacturing leadership well into the future. We've planned an additional \$5 million investment over the next decade. We want to keep the machinery updated and also be able to meet increased demand. Improving equipment and machining reduces human error, and results in a better, more dependable gearbox," detailed LeGrand.

He added, **"We're also investing in our production process. By implementing more efficient manufacturing methods and standardizing our work process, we're finding ways to improve our gearboxes even more in the future."**



## In the field

But perhaps the best test is in the field. Here, Valley gearboxes still receive the top score according to **David Drouhard of DD Farms in Othello, Washington**. "My 1974 Valley machine is still working. And more than half of the gearboxes on it are original and working well! We put quite a few hours on our equipment each year – over 2,000 in a year – and we have no problems, really," he stated. "In 1998, I needed to replace two gearboxes. I replaced one with a Valley gearbox and another with a competing gearbox to compare. Well, the competing gearbox is gone now, and it's been replaced with another Valley. The Valley from 1998 is still running strong. To me, that's the ultimate proof that these are by far the best gearboxes out there."

**Phil Gossi of Haggerman, Idaho** farms 160 hectares under pivots along with his father-in-law Bill Jones. They currently have 11 Valley pivots ranging in size and age – from as far back as 1976. Phil was tempted to try competing irrigation pivots – and gearboxes – but learned through experience that he preferred Valley. "I was talked into a cheaper product once, I'll be honest. I found they weren't worth anything, though," he explained. "Nothing compares to those Valley gearboxes. We've just bought additional land and by the end of this year, we'll put in Valley pivots. We've already ordered five."



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**As STRONG  
As They Come**

There are other noticeable differences between the Valley structure and the competitive structures that result in the superior strength and durability you get in a Valley. Take for example, the drive unit leg attachment, eight-bolt flange, wrap around gussets and welds, forged truss rod and the unique truss rod socket.

To Drouhard, all of this is important. "On other brand machines, you see where they're stressed. Not on the Valley, though. When differences are that visible, you know that the Valley machine is superior, even without all the testing data and documentation."

## Who Retires First – the Grower or his Valley?

With 36-year-old Valley machines still running well in some of his fields, Drouhard has seen over the years just how these design and engineering details contribute to dependability found in a Valley machine. This has earned Valley an important place on his farm. "Every piece of irrigation equipment I replace is replaced by a Valley. It's simple: I buy Valley. Sure, I can buy other machines cheaper, but they just don't compare when it comes to how dependable they are or how long they can run."

Drouhard plans to retire to Arizona in the next several years and rent his farmland in Washington. He joked that investing in Valley equipment for his farm was also an investment in his retirement. "Even renting farmland is easier when it has Valley machines on it. Everyone recognizes that Valley machines are superior."

## more Strength With Valley

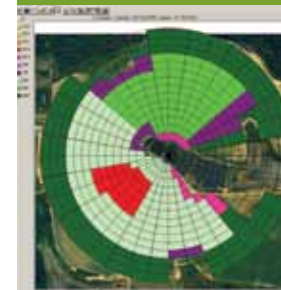
Valley débuts new products at the 2010 Farm Shows

### Bender30: Maximizing Potential



The Valley Bender30 option increases the number of acres a grower can irrigate at a low cost. By being able to bend any drive unit at a 30-degree angle, it allows the grower to easily wrap a tree line, feed lot or avoid obstacles in the field. With few additional parts, a Valley dealer can retrofit an existing pivot or design a new machine to maximize irrigation potential. Optional water shut off valves will shut off the sprinklers on the stopped spans while the activated bending portion of the pivot continues to apply water.

### Variable Rate Irrigation (VRI): Site specific, water application supports precision agriculture



This true precision irrigation technology takes water and nutrient efficiency to new levels with the potential for higher yield and lower input costs. VRI uses irrigation prescriptions based on yield maps, soil maps, Veris® maps, or other user defined conditions. It automatically adjusts user defined application depth by management zone as defined by the grower.

The patented Valley VRI Zone Control maximizes precision irrigation with individual sprinkler or span control. Manage up to 30 different zones along the pivot and 180 different sectors around the field with Valley VRI tower boxes and the Pro2 panel.

Valley VRI Speed Control also uses irrigation prescriptions defined by specific field conditions. It allows for sectors around the field every 2 degrees. No additional hardware needed. Upload prescriptions to your Valley Pro2 or Select2 Control Panel.

### TouchPro: Simplified Control Operation



The Valley TouchPro control panel with Touch technology simplifies control panel programming for pivot irrigation. It gives producers the option to personalize main screen controls to display irrigation information important to their operations, helping them to make quicker and more confident water management decisions. The control panel has improved control features such as a graphic view of the pivot, end-gun positions and wide boundary irrigation positions. The TouchPro panel is designed to withstand the most extreme temperatures, high humidity and transient voltage requirements. It is designed to provide growers uninterrupted performance and durability.

### Longer Span Options



New, longer spans are now available from Valley! These span options were developed to address specific needs and conditions and allow growers to reduce their overall per hectare installed cost. It can also potentially reduce the number of wheel tracks in the field by reducing the number of drive units needed. Growers and dealers can work together to design the most efficient, effective combination.